NanoSafer vs. 1.1 - Nanomaterial risk assessment using first order modeling

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NanoSafer vs. 1.1 Nanomaterial risk assessment using first order modeling

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1. NanoSafer

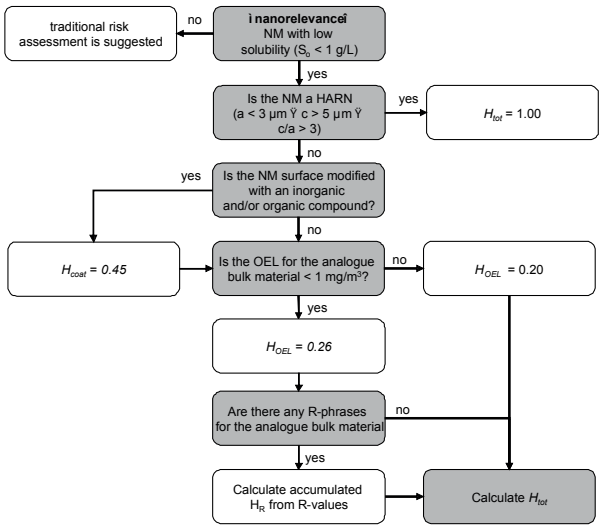
is an online control banding tool intended for SMEís. The system enables early risk assessment and guidance for safe production and use of Manufactured Nanomaterials (MN). Hazard assessment and case-specific exposure potentials are combined in an integrated risk assessment and risk management by control banding and e-learning.

2. Input data

are typically available from the producers' technical information sheets. The hazard data are given in the SDS for the closest analogue bulk material for which the requested occupational exposure limit (OEL) is given as well. The emission potential is either given by a constant release rate or the dustiness level determined using the EN15051 rotating drum or similar.

3. Hazard Evaluation

is based on the physicochemical properties of the MN (water solubility, aspect ratio, presence of coatings), risk sentences of the nearest bulk analogue compound deemed relevant for the respiratory tract and the occupational exposure limit (OEL) of the nearest bulk analogue compound.



4. Exposure Estimation

is made by two-box near-field (NF) and far-field (FF) source-to-recepter modelling assuming instant mixing. The emission potential is a constant emission rate (E_i, mg/min) or the powder dustiness levels (E_o, mg/kg) multiplied with a default activity energy factor (H_i) and the mass-flow (dM/dt) using either the total mass in the work cycle or the amount added in each transfer (e.g., bag) if the transfer takes longer than 1 minute. Powder dispersion and transfer between the NF and FF are calculated considering diffusion (κ) and the ventilation rates (Q) between the NF and FF compartments, the general FF ventilation rate, and the volumes (V) of the NF and FF compartments.